

LP171WP9
Liquid Crystal Display

Product Specification

SPECIFICATION FOR APPROVAL

(●) Preliminary Specification

() Final Specification

Title	17.1" WXGA+ TFT LCD
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BUYER	HP
MODEL	

SUPPLIER	LG Display Co., Ltd.
*MODEL	LP171WP9
Suffix	TLB1

*When you obtain standard approval,
please use the above model name without suffix

APPROVED BY	SIGNATURE
/	_____
/	_____
/	_____

Please return 1 copy for your confirmation with your signature and comments.

APPROVED BY	SIGNATURE
K. J. KWON / S.Manager	_____
REVIEWED BY	
G. J. Han / Manager	_____
PREPARED BY	
S. W. Park / Engineer S. G. Ann / Engineer	_____

Product Engineering Dept.
LG Display Co., Ltd

LP171WP9
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RECORD OF REVISIONS

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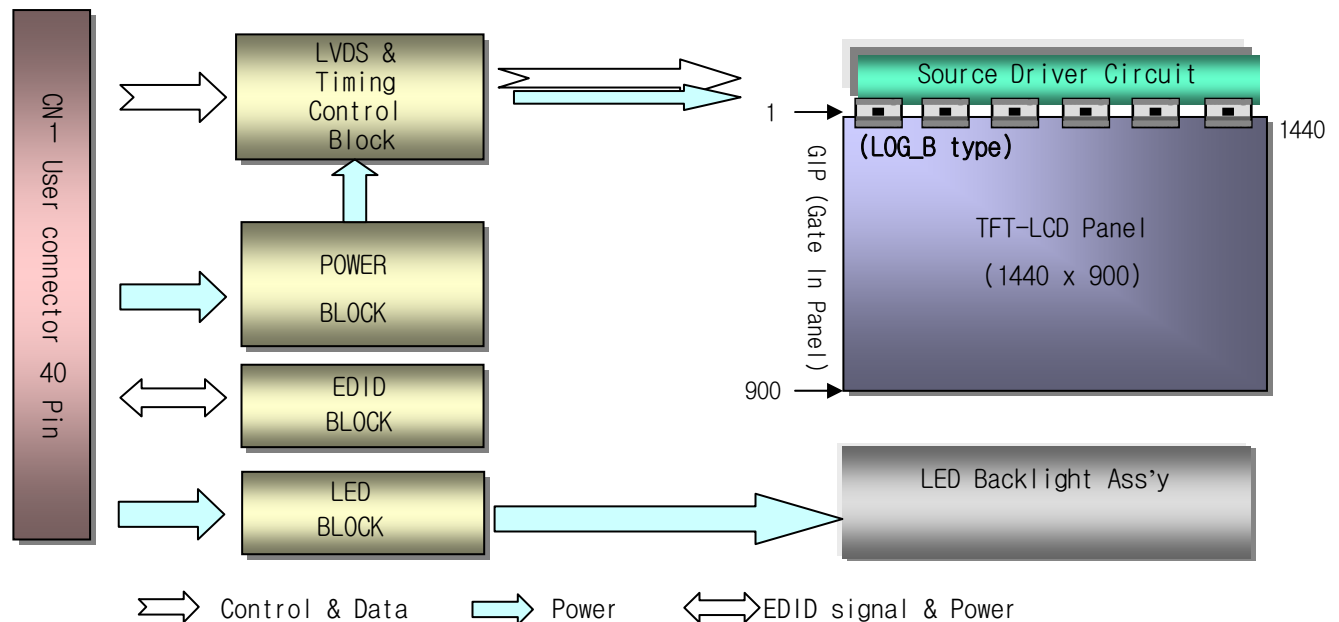
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1. General Description

The LP171WP9WF1 is a Color Active Matrix Liquid Crystal Display with an integral LED backlight system. The matrix employs a-Si Thin Film Transistor as the active element. It is a transmissive type display operating in the normally white mode. This TFT-LCD has 17.1 inches diagonally measured active display area with FHD resolution(1920 horizontal by 1080 vertical pixel array). Each pixel is divided into Red, Green and Blue sub-pixels or dots which are arranged in vertical stripes. Gray scale or the brightness of the sub-pixel color is determined with a 6-bit gray scale signal for each dot, thus, presenting a palette of more than 262,144 colors.

The LP171WP9 has been designed to apply the interface method that enables low power, high speed, low EMI.

The LP171WP9 is intended to support applications where thin thickness, low power are critical factors and graphic displays are important. In combination with the vertical arrangement of the sub-pixels, the LP171WP9 characteristics provide an excellent flat display for office automation products such as Notebook PC.



General Features

Active Screen Size	17.1 inches diagonal
Outline Dimension	382.2 (H) × 244.6 (V) × 6.5(D, max.) mm
Pixel Pitch	0.255 mm × 0.255 mm
Pixel Format	1440 horiz. by 900 vert. Pixels RGB strip arrangement
Color Depth	6-bit, 262,144 colors
Luminance, White	200 cd/m ² (typ., @I _{LED} =TBD mA), 5 points Min
Power Consumption	Total TBD Watt @LCM circuit TBD W(Typ.), LED TBD W (Typ.)
Weight	700g(Max.)
Display Operating Mode	Transmissive mode, normally white
Surface Treatment	Hard coating(3H), Anti-Glare treatment of the front polarizer
RoHS Comply	Yes

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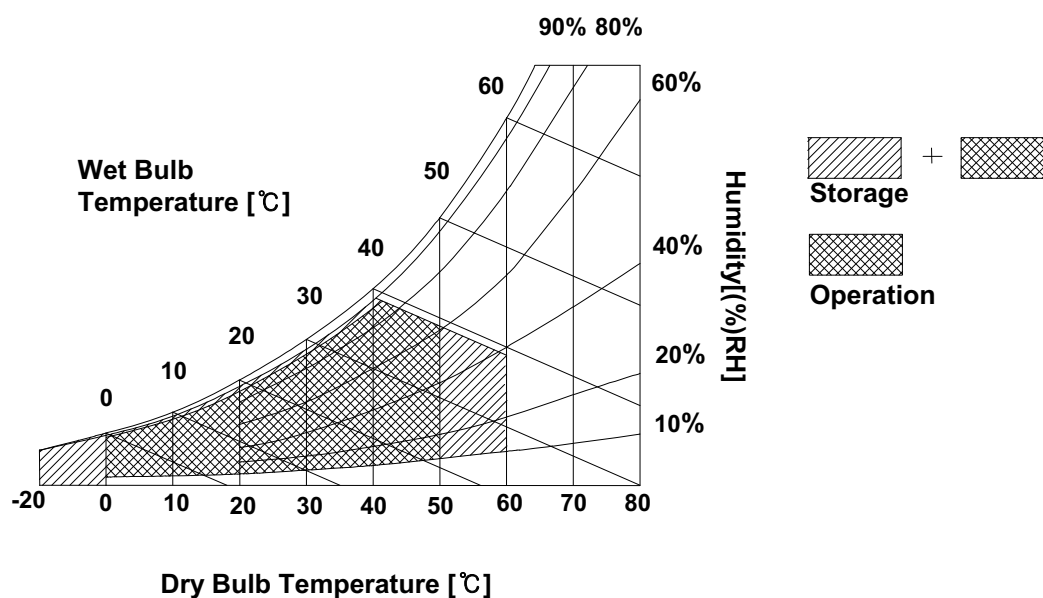
2. Absolute Maximum Ratings

The following are maximum values which, if exceeded, may cause faulty operation or damage to the unit.

Table 1. ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Values		Units	Notes
		Min	Max		
Power Input Voltage	VCC	-0.3	4.0	Vdc	at 25 ± 5°C
Operating Temperature	TOP	0	50	°C	1
Storage Temperature	HST	-20	60	°C	1
Operating Ambient Humidity	HOP	10	90	%RH	1
Storage Humidity	HST	10	90	%RH	1

Note : 1. Temperature and relative humidity range are shown in the figure below.
 Wet bulb temperature should be 39°C Max, and no condensation of water.





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3. Electrical Specifications

3-1. Electrical Characteristics

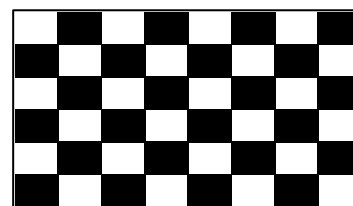
The LP171WP9 requires two power inputs. The first logic is employed to power the LCD electronics and to drive the TFT array and liquid crystal. The second backlight is the input about LED BL.with LED Driver.

Table 2. ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Values			Unit	Notes
		Min	Typ	Max		
LOGIC :						
Power Supply Input Voltage	V _{CC}	3.0	3.3	3.6	V	
Power Supply Input Current	I _{CC}	-	TBD	TBD	mA	1
Power Consumption	P _{CC}	-	TBD	TBD	W	1
Power Supply Inrush Current	I _{CC_P}	-	-	1500	mA	
LVDS Impedance	Z _{LVDS}	90	100	110	Ω	2
BACKLIGHT : (with LED Driver)						
LED Power Input Voltage	V _{LED}	7.0	12.0	20.0	V	
LED Power Input Current	I _{LED}	-	TBD	TBD	mA	3
LED Power Consumption	P _{LED}	-	TBD	TBD	W	3
LED Power Inrush Current	I _{LED_P}	-	-	1500	mA	
PWM Dimming (Duty) Ratio	-	20.0	-	100	%	4
PWM Impedance	Z _{PWM}	20	40	60	kΩ	
PWM Frequency	F _{PWM}	200		1000	Hz	5
PWM High Level Voltage	V _{PWM_H}	3.0	-	5.3	V	
PWM Low Level Voltage	V _{PWM_L}	0	-	0.5	V	
LED_EN Impedance	Z _{LED_EN}	20	40	60	kΩ	
LED_EN High Voltage	V _{LED_EN_H}	3.0	-	5.3	V	
LED_EN Low Voltage	V _{LED_EN_L}	0	-	0.5	V	
Life Time		12,000	-	-	Hrs	6

Note)

1. The specified I_{CC} current and power consumption are under the V_{CC} = 3.3V , 25°C , f_v = 60Hz condition whereas Mosaic pattern is displayed and f_v is the frame frequency.



2. This impedance value is needed to proper display and measured form LVDS Tx to the mating connector.
3. The specified LED current and power consumption are under the V_{LED} = 12.0V , 25°C , Dimming of Max luminance whereas White pattern is displayed and f_v is the frame frequency.
4. The operation of LED Driver below minimum dimming ratio may cause flickering or reliability issue.
5. This Spec. is not effective at 100% dimming ratio as an exception because it has DC level equivalent to 0Hz. In spite of acceptable range as defined, the PWM Frequency should be fixed and stable for more consistent brightness control at any specific level desired.
6. The life time is determined as the time at which the typical brightness of LCD is 50% compare to that of initial value at the typical LED current. These LED backlight has 6 strings on it and the typical current of LED's string is base on TBDmA.



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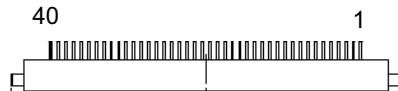
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3-2. Interface Connections

This LCD employs two interface connections, a 40 pin connector is used for the module electronics interface and the other connector is used for the integral backlight system.

The electronics interface connector is a model FI-NXB40SL-HF10 manufactured by JAE

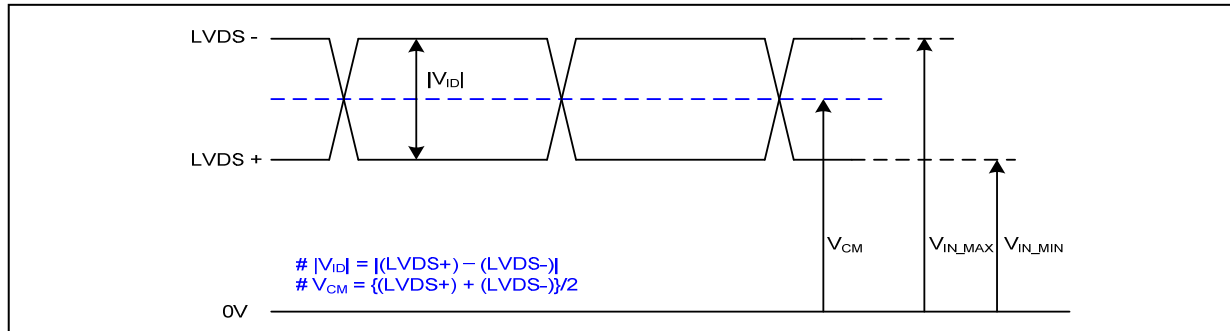
Table 3. MODULE CONNECTOR PIN CONFIGURATION (CN1)

Pin	Symbol	Description	Notes
1	NC	No Connection (Reserved for supplier)	[Interface Chip] 1. LCD : SW, SW0617(LCD Controller) Including LVDS Receiver. 2. System : SiWLVDSDRx or equivalent * Pin to Pin compatible with LVDS
2	VCC	Power Supply, 3.3V (typical)	
3	VCC	Power Supply, 3.3V (typical)	
4	V_EEDID	DDC 3.3V power	
5	NC	No Connection	
6	CLK EEDID	DDC Clock	
7	DATA EEDID	DDC Data	[Connector] JAE, FI-NXB40SL-HF10 (Locking type) or equivalent
8	Odd Rin0-	- LVDS differential data input (R0-R5, G0)	
9	Odd Rn0+	+ LVDS differential data input (R0-R5, G0)	[Mating Connector] FI-NX400L or equivalent
10	GND	Ground	
11	Odd Rin1-	- LVDS differential data input (G1-G5, B0-B1)	[Connector pin arrangement] 
12	Odd Rn1+	+ LVDS differential data input (G1-G5, B0-B1)	
13	GND	Ground	
14	Odd Rin2-	- LVDS differential data input (B2-B5,HS,VS, DE)	
15	Odd Rn2+	+ LVDS differential data input (B2-B5,HS,VS, DE)	
16	GND	Ground	
17	Odd ClkIN-	- LVDS differential clock input	
18	Odd ClkIN+	+ LVDS differential clock input	
19	GND	Ground	
20	Even Rin0-	- LVDS differential data input (R0-R5, G0)	
21	Even Rn0+	+ LVDS differential data input (R0-R5, G0)	
22	GND	Ground	
23	Even Rin1-	- LVDS differential data input (G1-G5, B0-B1)	
24	Even Rn1+	+ LVDS differential data input (G1-G5, B0-B1)	
25	GND	Ground	
26	Even Rin2-	- LVDS differential data input (B2-B5,HS,VS, DE)	
27	Even Rn2+	+ LVDS differential data input (B2-B5,HS,VS, DE)	
28	GND	Ground	
29	Even ClkIN-	- LVDS differential clock input	
30	Even ClkIN+	+ LVDS differential clock input	
31	GND	LED Ground	
32	GND	LED Ground	
33	GND	LED Ground	
34	NC	No Connection (Reserved for supplier)	
35	VLED	LED Power Supply 6V-20V	
36	VLED	LED Power Supply 6V-20V	
37	VLED	LED Power Supply 6V-20V	
38	PWM	PWM for luminance control	
39	LED_EN	BL On/Off	
40	NC	No Connection (Reserved for supplier)	

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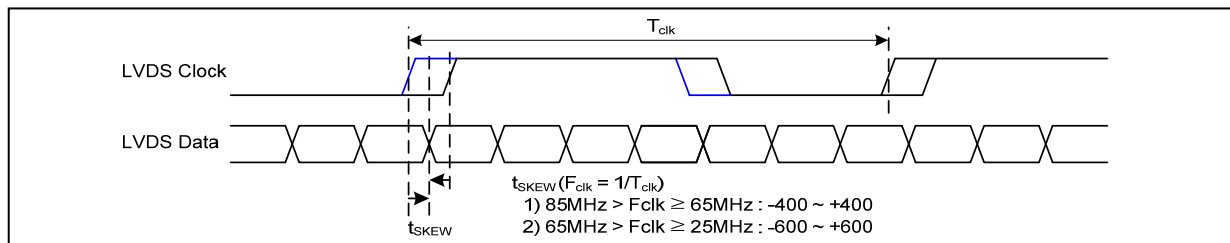
3-3. LVDS Signal Timing Specifications

3-3-1. DC Specification



Description	Symbol	Min	Max	Unit	Notes
LVDS Differential Voltage	$ V_{ID} $	100	600	mV	-
LVDS Common mode Voltage	V_{CM}	0.6	1.8	V	-
LVDS Input Voltage Range	V_{IN}	0.3	2.1	V	-

3-3-2. AC Specification



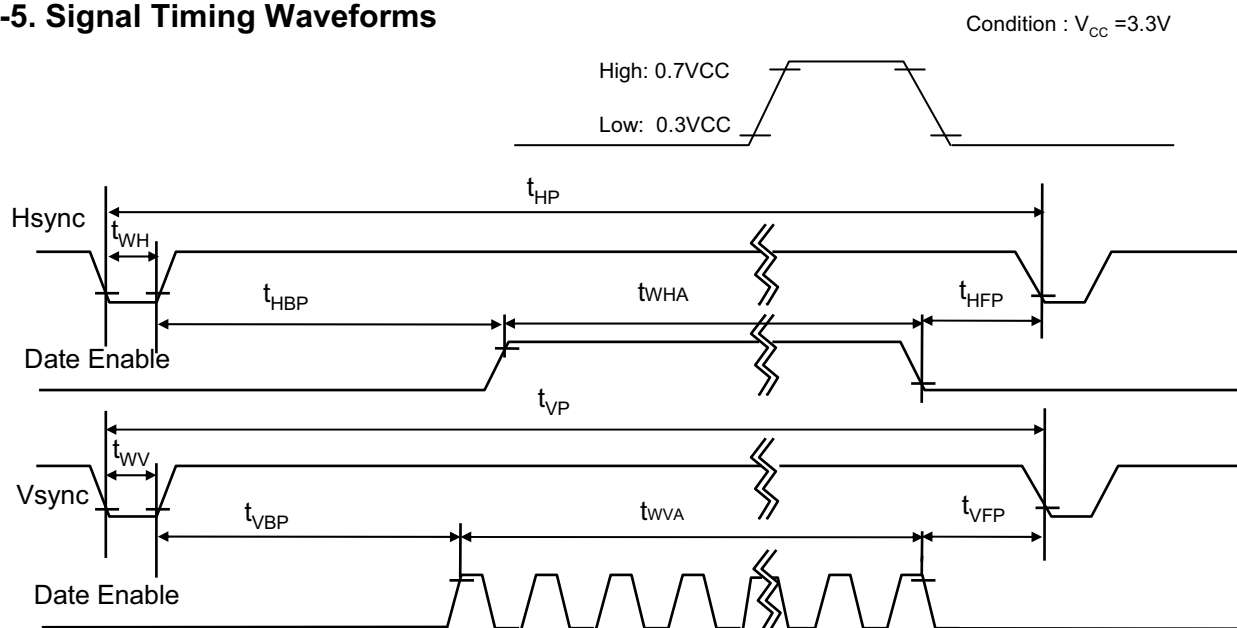
Description	Symbol	Min	Max	Unit	Notes
LVDS Clock to Data Skew Margin	t_{SKEW}	- 400	+ 400	ps	$85MHz > F_{clk} \geq 65MHz$
	t_{SKEW}	- 600	+ 600	ps	$65MHz > F_{clk} \geq 25MHz$
LVDS Clock to Clock Skew Margin (Even to Odd)	t_{SKEW_EO}	- 1/7	+ 1/7	T_{clk}	-
Maximum deviation of input clock frequency during SSC	F_{DEV}	-	± 3	%	-
Maximum modulation frequency of input clock during SSC	F_{MOD}	-	200	KHz	-

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3-4. Signal Timing Specifications

This is the signal timing required at the input of the User connector. All of the interface signal timing should be satisfied with the following specifications and specifications of LVDS Tx/Rx for its proper operation.

Table 5. TIMING TABLE

ITEM	Symbol		Min.	Typ.	Max.	Unit	Note
DCLK	Frequency	f_{CLK}	-	54.75	-	MHz	2port
Hsync	Period	t_{HP}	952	1000	1048	tCLK	2port
	Width	t_{WH}	32	40	48		
	Width-Active	tw_{HA}	720	720	720		
Vsync	Period	t_{VP}	907	912	926	tHP	
	Width	t_{WV}	2	3	5		
	Width-Active	tw_{VA}	900	900	900		
Data Enable	Horizontal back porch	t_{HBP}	176	200	224	tCLK	2port
	Horizontal front porch	t_{HFP}	24	40	56		
	Vertical back porch	t_{VBP}	4	7	15	tHP	
	Vertical front porch	t_{VFP}	1	2	6		

3-5. Signal Timing Waveforms


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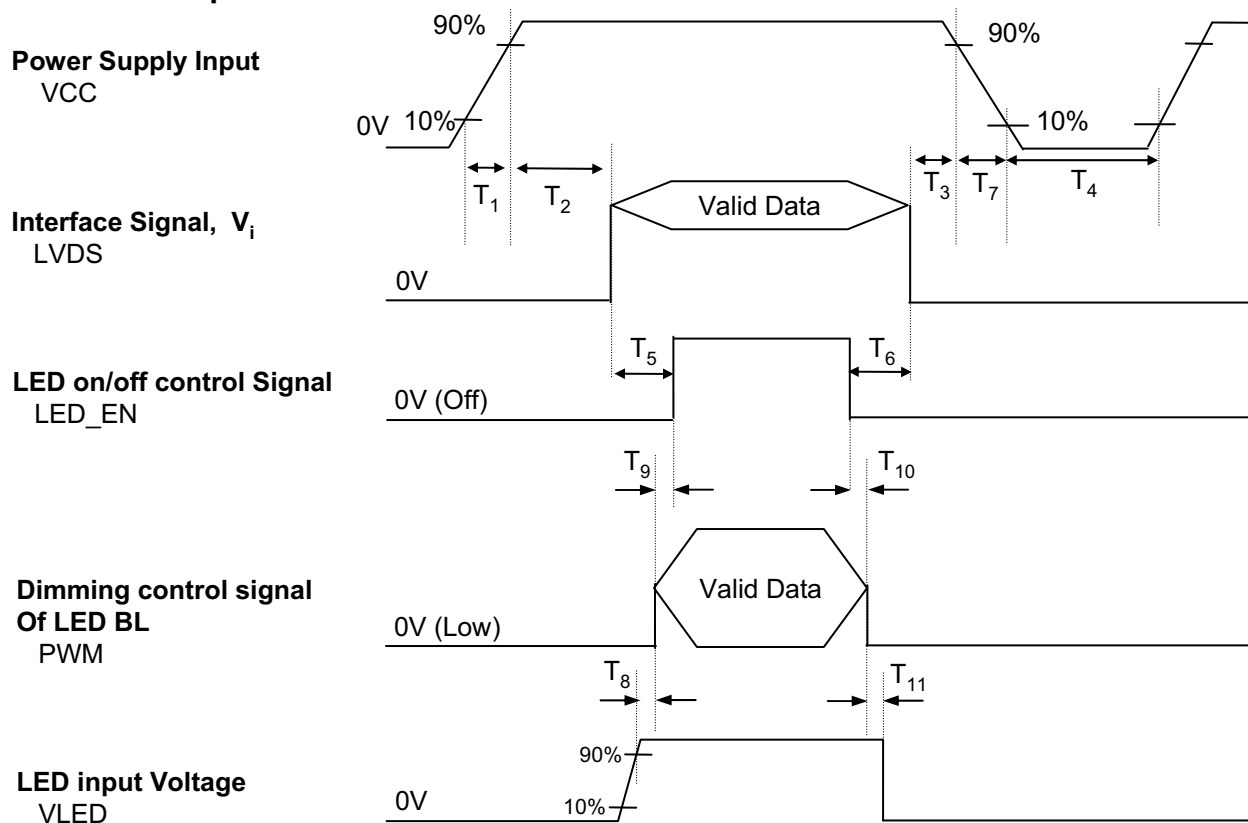
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3-6. Color Input Data Reference

The brightness of each primary color (red, green and blue) is based on the 6-bit gray scale data input for the color ; the higher the binary input, the brighter the color. The table below provides a reference for color versus data input.

Table 6. COLOR DATA REFERENCE

Color		Input Color Data																	
		RED						GREEN						BLUE					
		MSB			LSB			MSB			LSB			MSB			LSB		
		R 5	R 4	R 3	R 2	R 1	R 0	G 5	G 4	G 3	G 2	G 1	G 0	B 5	B 4	B 3	B 2	B 1	B 0
Basic Color	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
	Green	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
	Cyan	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
	Magenta	1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
RED	RED (00)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED (01)	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	...																		
	RED (62)	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED (63)	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
GREEN	GREEN (00)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	GREEN (01)	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	...																		
	GREEN (62)	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0
	GREEN (63)	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
BLUE	BLUE (00)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	BLUE (01)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	...																		
	BLUE (62)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0
	BLUE (63)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1

Product Specification
3-7. Power Sequence

Table 6. POWER SEQUENCE TABLE

Parameter	Value			Units
	Min.	Typ.	Max.	
T ₁	0.5	-	10	ms
T ₂	0	-	50	ms
T ₃	0	-	50	ms
T ₄	400	-	-	ms
T ₅	200	-	-	ms
T ₆	200	-	-	ms
T ₇	3	-	10	ms
T ₈	10	-	-	ms
T ₉	0	-	-	ms
T ₁₀	0	-	-	ms
T ₁₁	10	-	-	ms

Note)

1. Valid Data is Data to meet "3-3. LVDS Signal Timing Specifications"
2. Please avoid floating state of interface signal at invalid period.
3. When the interface signal is invalid, be sure to pull down the power supply for LCD VCC to 0V.
4. VLED recommend to be turn on after power supply for LCD and interface signal are valid.

Product Specification

4. Optical Specification

Optical characteristics are determined after the unit has been 'ON' and stable for approximately 20 minutes in a dark environment at 25°C. The values specified are at an approximate distance 50cm from the LCD surface at a viewing angle of Φ and Θ equal to 0°.

FIG. 1 presents additional information concerning the measurement equipment and method.

FIG. 1 Optical Characteristic Measurement Equipment and Method

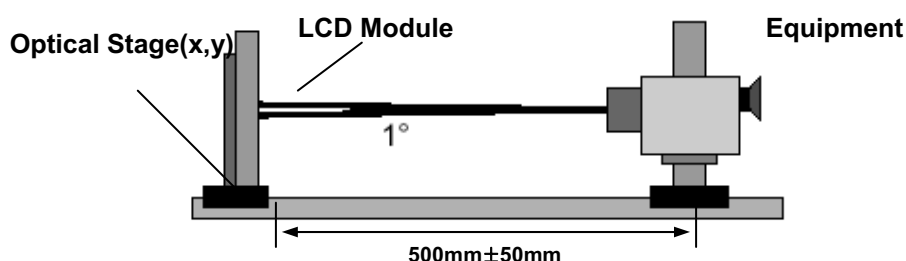


Table 8. OPTICAL CHARACTERISTICS

Ta=25°C, VCC=3.3V, fv=60Hz, fCLK= 97.75MHz, ILED =TBD mA

Parameter	Symbol	Values			Units	Notes	
		Min	Typ	Max			
Contrast Ratio	CR	300	400	-		1	
Surface Luminance, white	L _{WH}	170	200	-	cd/m²	2	
Luminance Variation	δ _{WHITE}		1.4	1.6		3	
Response Time	Tr _R + Tr _D	-	16	25	ms	4	
Color Coordinates							
	RED	RX	TBD	TBD	TBD		
		RY	TBD	TBD	TBD		
	GREEN	GX	TBD	TBD	TBD		
		GY	TBD	TBD	TBD		
	BLUE	BX	TBD	TBD	TBD		
		BY	TBD	TBD	TBD		
	WHITE	WX	0.283	0.313	0.343		
		WY	0.299	0.329	0.359		
Viewing Angle							
	x axis, right(Φ=0°)	Θr	40	45	-	degree	5
	x axis, left (Φ=180°)	Θl	40	45	-	degree	
	y axis, up (Φ=90°)	Θu	40	45	-	degree	
	y axis, down (Φ=270°)	Θd	40	45	-	degree	
	Gray Scale						
Color Gamut	C/G	-	45	-	%	6	

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Note)

1. Contrast Ratio(CR) is defined mathematically as

$$\text{Contrast Ratio} = \frac{\text{Surface Luminance with all white pixels}}{\text{Surface Luminance with all black pixels}}$$

2. Surface luminance is the average of 5 point across the LCD surface 50cm from the surface with all pixels displaying white. For more information see FIG 1.

$$\text{LWH} = \text{Average}(\text{L1}, \text{L2}, \dots \text{L5})$$

3. The variation in surface luminance, The panel total variation (δ WHITE) is determined by measuring LN at each test position 1 through 13 and then defined as followed numerical formula.
For more information see FIG 2.

$$\delta \text{ WHITE} (= \frac{\text{Maximum}(\text{L1}, \text{L2}, \dots \text{L13}) - \text{Minimum}(\text{L1}, \text{L2}, \dots \text{L13})}{\text{Maximum}(\text{L1}, \text{L2}, \dots \text{L13})} * 100(\%)$$

4. Response time is the time required for the display to transition from white to black (rise time, TrR) and from black to white(Decay Time, TrD). For additional information see FIG 3.
5. Viewing angle is the angle at which the contrast ratio is greater than 10. The angles are determined for the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to the LCD surface. For more information see FIG 4.

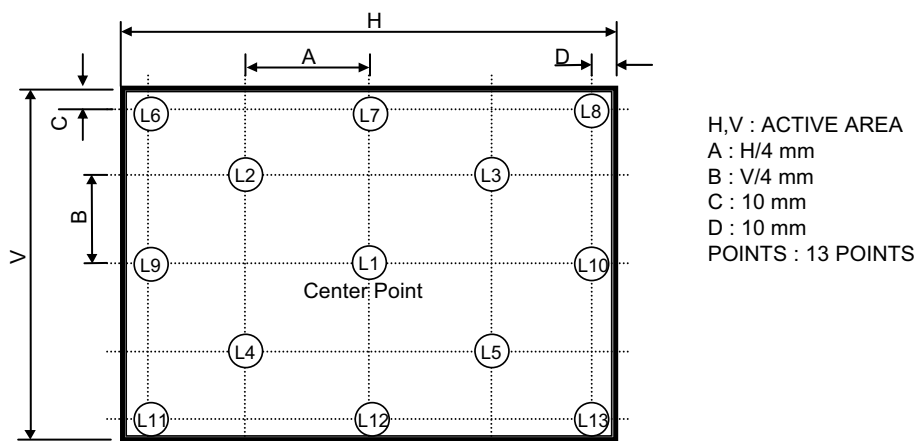
6. Gray scale specification

* fV = 60Hz

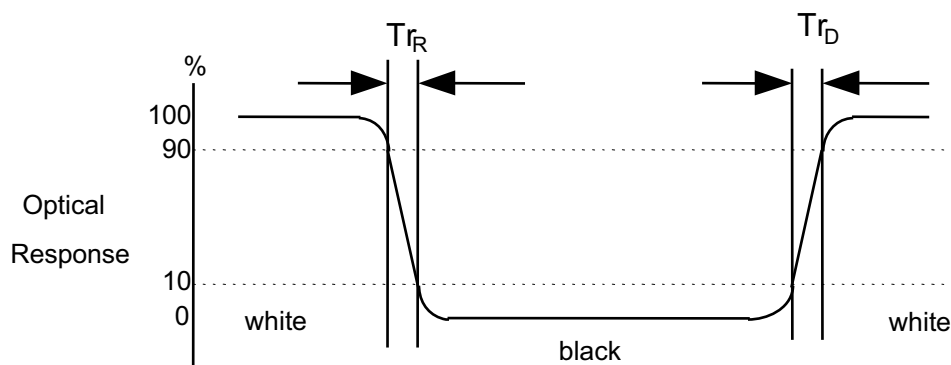
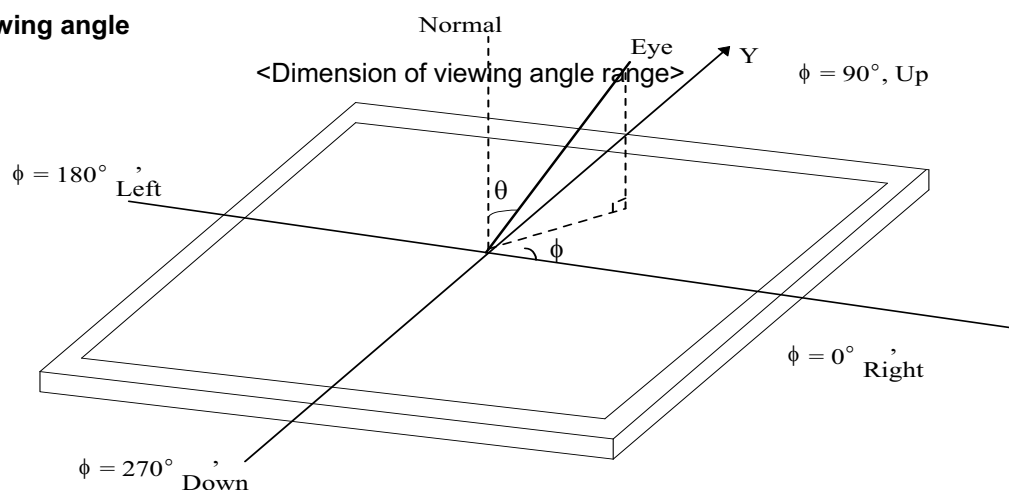
Gray Level	Luminance [%] (Typ)
L0	TBD
L7	TBD
L15	TBD
L23	TBD
L31	TBD
L39	TBD
L47	TBD
L55	TBD
L63	100

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FIG. 2 Luminance

<Measuring point for Average Luminance & measuring point for Luminance variation>


FIG. 3 Response Time

The response time is defined as the following figure and shall be measured by switching the input signal for "black" and "white".


FIG. 4 Viewing angle


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5. Mechanical Characteristics

The contents provide general mechanical characteristics for the model LP171WP9.
In addition the figures in the next page are detailed mechanical drawing of the LCD.

Outline Dimension	Horizontal	$382.2 \pm 0.5\text{mm}$
	Vertical	$244.6 \pm 0.5\text{mm}$
	Thickness	6.5mm (max)
Bezel Area	Horizontal	$370.6 \pm 0.5\text{mm}$
	Vertical	$232.9 \pm 0.5\text{mm}$
Active Display Area	Horizontal	367.2 mm
	Vertical	229.5 mm
Weight	700g (Max.)	
Surface Treatment	Hard Coating (3H), Anti-Glare treatment of the front polarizer	



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<FRONT VIEW>

Note) Unit:[mm], General tolerance: $\pm 0.5\text{mm}$

TBD



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<REAR VIEW>

Note) Unit:[mm], General tolerance: $\pm 0.5\text{mm}$

TBD

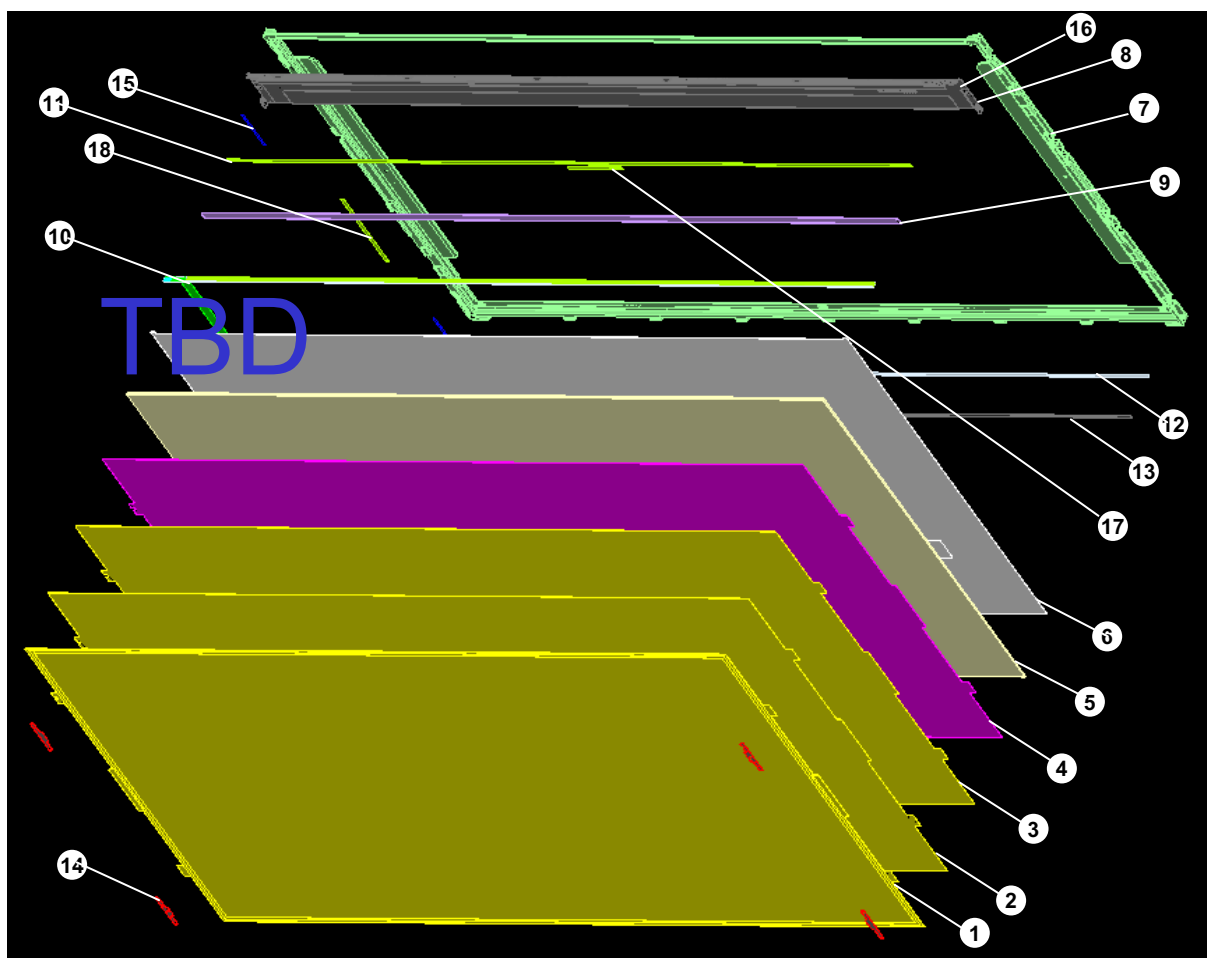


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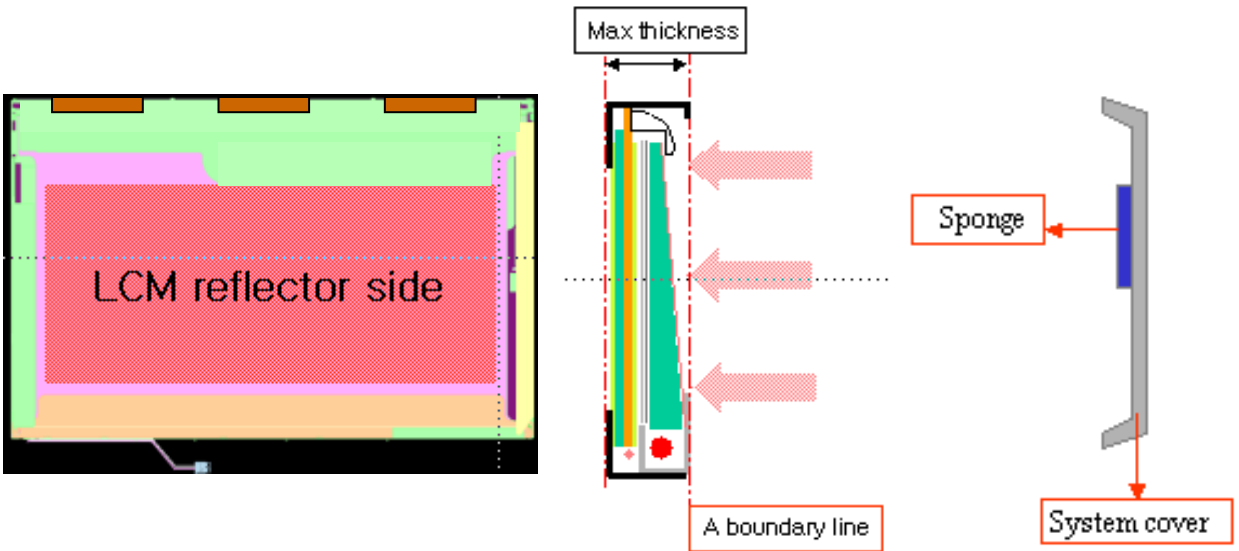
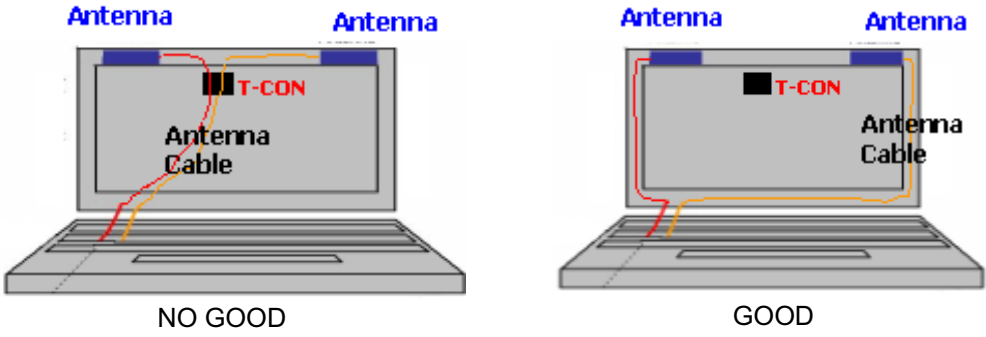
[DETAIL DESCRIPTION OF SIDE MOUNTING SCREW]

TBD

Backlight Exploded View. (Appendix)

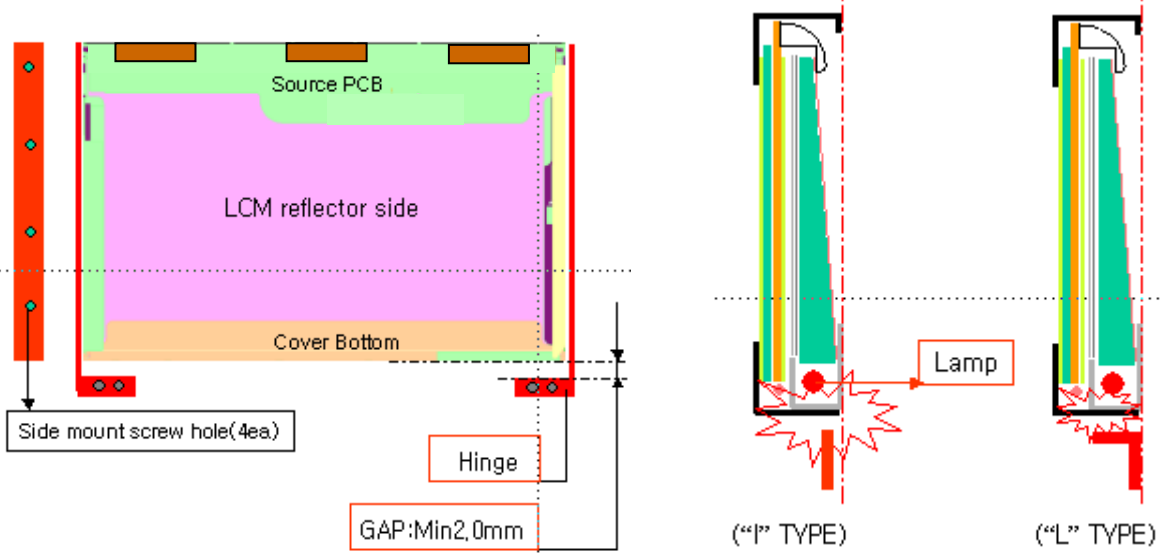
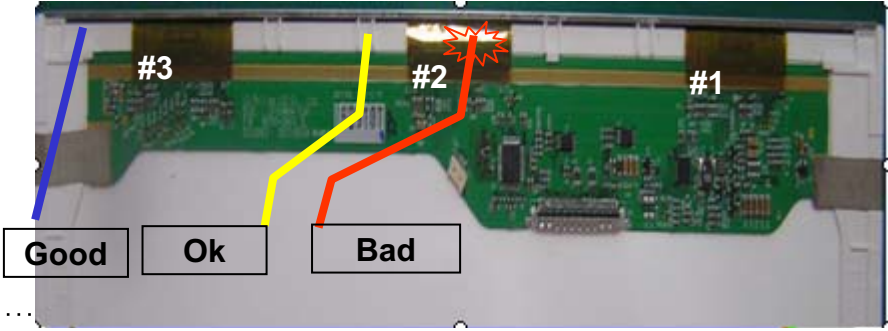
No	Part Name	No	Part Name
1	Diffuser Up Sheet	10	LED Array
2	Prism Up Sheet	11	Cover Bottom Fixing Double Tape
3	Prism Down Sheet	12	LGP Fixing Double Tape
4	Diffuser Down Sheet	13	Reflective Single Tape
5	Light Guide Panel	14	Sheet Fixing Pad (4pcs)
6	Reflector	15	Panel Fixing Pad (2pcs)
7	Supporter Main	16	Screw (2pcs)
8	Cover Bottom	17	Reflector Fixing Tape
9	LED Housing	18	FPC Fixing Tape

LGD Proposal for system cover design.(Appendix)

1	Gap check for securing the enough gap between LCM and System cover.	
 The diagram illustrates the gap check for securing the enough gap between LCM and System cover. It shows a cross-section of the LCM reflector side (red area) and the system cover (grey area). A dashed line indicates the 'Max thickness' of the gap. A red arrow points to the 'Sponge' layer. A red arrow points to the 'System cover'. A red arrow points to the 'A boundary line'.		
Define	1.Rear side of LCM is sensitive against external stress,and previous check about interference is highly needed. 2.In case there is something from system cover comes into the boundary above,mechanical interference may cause the FOS defects. (Eg:Ripple,White spot..)	
2	Check if antenna cable is sufficiently apart from T-CON of LCD Module.	
Define	 The diagram shows two scenarios for antenna cable placement relative to the T-CON. The left scenario, labeled 'NO GOOD', shows the antenna cable (red line) overlapping the T-CON (black square). The right scenario, labeled 'GOOD', shows the antenna cable (red line) separated from the T-CON. Labels include 'Antenna' (blue), 'T-CON' (black), and 'Antenna Cable' (red).	
	1.If system antenna is overlapped with T-CON,it might be cause the noise.	

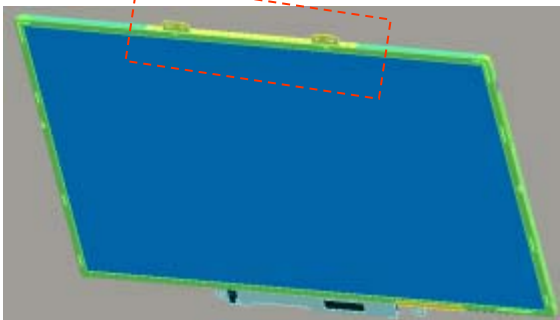
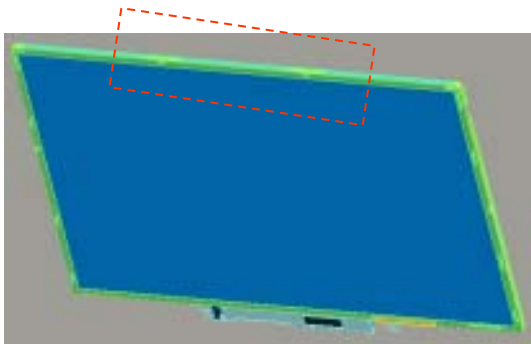
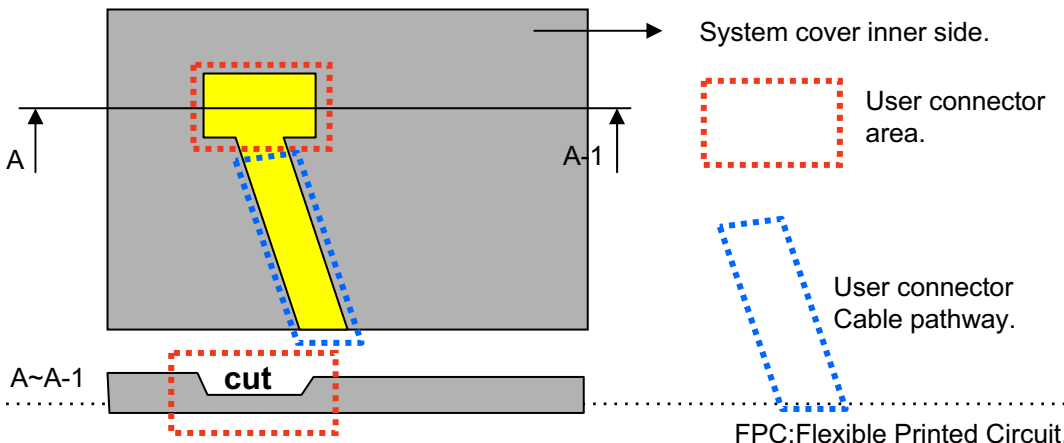
Product Specification

LGD Proposal for system cover design.

3	Gap check for securing the enough gap between LCM and System hinge.	
		
Define	1. At least 2.0mm of gap needs to be secured to prevent the shock related defects. 2. "L" type of hinge is recommended than "I" type under shock test.	
4	Checking the path of the System wire.	
		
Define	1. COF area needs to be handled with care. 2. GOOD → Wire path design to system side. OK → Wire path is located between COFs. BAD → Wire path overlapped with COF area.	

Product Specification

LGD Proposal for system cover design.

5	Using a bracket on the top of LCM is not recommended.	
 bracket  With bracket  Without bracket		
Define	1.Condition without bracket is good for mechanical noise,and can minimize the light leakage from deformation of bracket. 2.The results shows that there is no difference between the condition with or without bracket.	
6	Securing additional gap on CNT area..	
		
Define	1.CNT area is specially sensitive against external stress,and additional gap by cutting on system cover will be helpful on removing the Ripple. 2.Using a thinner CNT will be better. (eg: FPC type)	

Product Specification

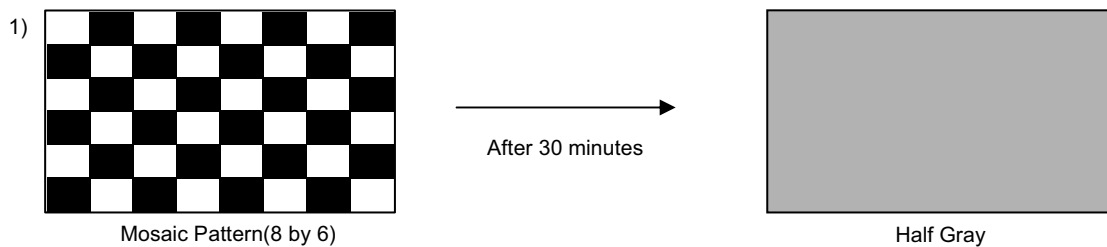
6. Reliability

Environment test condition

No.	Test Item	Conditions
1	High temperature storage test	Ta= 60°C, 240h
2	Low temperature storage test	Ta= -20°C, 240h
3	High temperature operation test	Ta= 50°C, 50%RH, 240h
4	Low temperature operation test	Ta= 0°C, 240h
5	Vibration test (non-operating)	Sine wave, 5 ~ 150Hz, 1.5G, 0.37oct/min 3 axis, 30min/axis
6	Shock test (non-operating)	Half sine wave, 180G, 2ms one shock of each six faces(I.e. run 180G 2ms for all six faces)
7	Altitude operating storage / shipment	0 ~ 10,000 feet (3,048m) 24Hr 0 ~ 40,000 feet (12,192m) 24Hr
8	Image Sticking ¹⁾	Ta= 25°C, Pattern : Mosaic(8 by 6), Operating Time : 30 min Lamp Operating Current : 6.0mA

{ Result Evaluation Criteria }

There should be no change which might affect the practical display function when the display quality test is conducted under normal operating condition.



<Judgment Condition>

: Operating during 30 minutes with Mosaic Pattern(8 by 6), there is no Image Sticking after 10 second with half gray pattern.

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7. International Standards

7-1. Safety

- a) UL 60950-1:2003, First Edition, Underwriters Laboratories, Inc., Standard for Safety of Information Technology Equipment.
- b) CAN/CSA C22.2, No. 60950-1-03 1st Ed. April 1, 2003, Canadian Standards Association, Standard for Safety of Information Technology Equipment.
- c) EN 60950-1:2001, First Edition, European Committee for Electrotechnical Standardization(CENELEC) European Standard for Safety of Information Technology Equipment.

TBD

7-2. EMC

- a) ANSI C63.4 "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electrical Equipment in the Range of 9kHz to 40GHz. "American National Standards Institute(ANSI), 1992
- b) CISPR22 "Limits and Methods of Measurement of Radio Interface Characteristics of Information Technology Equipment." International Special Committee on Radio Interference.
- c) EN 55022 "Limits and Methods of Measurement of Radio Interface Characteristics of Information Technology Equipment." European Committee for Electrotechnical Standardization.(CENELEC), 1998 (Including A1: 2000)

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8. Packing

8-1. Designation of Lot Mark

a) Lot Mark

A	B	C	D	E	F	G	H	I	J	K	L	M
---	---	---	---	---	---	---	---	---	---	---	---	---

A,B,C : SIZE(INCH)

E : MONTH

D : YEAR

F ~ M : SERIAL NO.

Note

1. YEAR

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Mark	1	2	3	4	5	6	7	8	9	0

2. MONTH

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mark	1	2	3	4	5	6	7	8	9	A	B	C

b) Location of Lot Mark

Serial No. is printed on the label. The label is attached to the backside of the LCD module.

This is subject to change without prior notice.

8-2. Packing Form

a) Package quantity in one box : 20 pcs

b) Box Size : 482mm × 371mm × 325mm

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9. PRECAUTIONS

Please pay attention to the followings when you use this TFT LCD module.

9-1. MOUNTING PRECAUTIONS

- (1) You must mount a module using holes arranged in four corners or four sides.
- (2) You should consider the mounting structure so that uneven force (ex. Twisted stress) is not applied to the module. And the case on which a module is mounted should have sufficient strength so that external force is not transmitted directly to the module.
- (3) Please attach the surface transparent protective plate to the surface in order to protect the polarizer. Transparent protective plate should have sufficient strength in order to resist external force.
- (4) You should adopt radiation structure to satisfy the temperature specification.
- (5) Acetic acid type and chlorine type materials for the cover case are not desirable because the former generates corrosive gas of attacking the polarizer at high temperature and the latter causes circuit break by electro-chemical reaction.
- (6) Do not touch, push or rub the exposed polarizers with glass, tweezers or anything harder than HB pencil lead. And please do not rub with dust clothes with chemical treatment. Do not touch the surface of polarizer for bare hand or greasy cloth. (Some cosmetics are detrimental to the polarizer.)
- (7) When the surface becomes dusty, please wipe gently with absorbent cotton or other soft materials like chamois soaks with petroleum benzene. Normal-hexane is recommended for cleaning the adhesives used to attach front / rear polarizers. Do not use acetone, toluene and alcohol because they cause chemical damage to the polarizer.
- (8) Wipe off saliva or water drops as soon as possible. Their long time contact with polarizer causes deformations and color fading.
- (9) Do not open the case because inside circuits do not have sufficient strength.

9-2. OPERATING PRECAUTIONS

- (1) The spike noise causes the mis-operation of circuits. It should be lower than following voltage :
 $V = \pm 200\text{mV}$ (Over and under shoot voltage)
- (2) Response time depends on the temperature. (In lower temperature, it becomes longer.)
- (3) Brightness depends on the temperature. (In lower temperature, it becomes lower.)
And in lower temperature, response time (required time that brightness is stable after turned on) becomes longer.
- (4) Be careful for condensation at sudden temperature change. Condensation makes damage to polarizer or electrical contacted parts. And after fading condensation, smear or spot will occur.
- (5) When fixed patterns are displayed for a long time, remnant image is likely to occur.
- (6) Module has high frequency circuits. Sufficient suppression to the electromagnetic interference shall be done by system manufacturers. Grounding and shielding methods may be important to minimize the interference.

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9-3. ELECTROSTATIC DISCHARGE CONTROL

Since a module is composed of electronic circuits, it is not strong to electrostatic discharge. Make certain that treatment persons are connected to ground through wrist band etc. And don't touch interface pin directly.

9-4. PRECAUTIONS FOR STRONG LIGHT EXPOSURE

Strong light exposure causes degradation of polarizer and color filter.

9-5. STORAGE

When storing modules as spares for a long time, the following precautions are necessary.

- (1) Store them in a dark place. Do not expose the module to sunlight or fluorescent light. Keep the temperature between 5°C and 35°C at normal humidity.
- (2) The polarizer surface should not come in contact with any other object.
It is recommended that they be stored in the container in which they were shipped.

9-6. HANDLING PRECAUTIONS FOR PROTECTION FILM

- (1) When the protection film is peeled off, static electricity is generated between the film and polarizer.
This should be peeled off slowly and carefully by people who are electrically grounded and with well ion-blown equipment or in such a condition, etc.
- (2) The protection film is attached to the polarizer with a small amount of glue. If some stress is applied to rub the protection film against the polarizer during the time you peel off the film, the glue is apt to remain on the polarizer.
Please carefully peel off the protection film without rubbing it against the polarizer.
- (3) When the module with protection film attached is stored for a long time, sometimes there remains a very small amount of glue still on the polarizer after the protection film is peeled off.
- (4) You can remove the glue easily. When the glue remains on the polarizer surface or its vestige is recognized, please wipe them off with absorbent cotton waste or other soft material like chamois soaked with normal-hexane.



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APPENDIX A. Enhanced Extended Display Identification Data (EEDID™) 1/3

TBD



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APPENDIX A. Enhanced Extended Display Identification Data (EEDID™) 2/3

TBD



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APPENDIX A. Enhanced Extended Display Identification Data (EEDID™) 3/3

TBD